



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2021-0511; Project Identifier AD-2020-01229-E]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Williams International Co., L.L.C. Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The FAA proposes to adopt a new airworthiness directive (AD) for certain Williams International Co., L.L.C. (Williams) FJ44-2A, FJ44-2C, FJ44-3A, and FJ44-3A-24 model turbofan engines. This proposed AD was prompted by a report of cracks in high-pressure turbine (HPT) disk posts and failure of an HPT disk post. This proposed AD would require the removal and replacement of the affected HPT disk before reaching its new life limit. The FAA is proposing this AD to address the unsafe condition on these products.

**DATES:** The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: (202) 493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Williams International Co., L.L.C., Product Support, 2000 Centerpoint Pkwy, Pontiac, MI 48341; phone: (800)

859-3544; website: <http://www.williams-int.com/product-support>. You may view this service information at the Chicago ACO Branch, 2300 East Devon Avenue, Des Plaines, IL 60018. For information on the availability of this material at the FAA, call (781) 238-7759.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0511; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, any comments received, and other information. The street address for Docket Operations is listed above.

**FOR FURTHER INFORMATION CONTACT:** Kyle Bush, Aviation Safety Engineer, Chicago ACO Branch, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018; phone: (847) 294-7870; fax: (847) 294-7834; email: [kyle.bush@faa.gov](mailto:kyle.bush@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under ADDRESSES. Include “Docket No. FAA-2021-0511; Project Identifier AD-2020-01229-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

#### **Confidential Business Information**

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C.

552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as "PROPIN." The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Kyle Bush, Aviation Safety Engineer, Chicago ACO Branch, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

### **Background**

The FAA received a report that Williams discovered cracks in one HPT disk post during a scheduled inspection of an FJ44-2A model turbofan engine. An operator also discovered that one HPT disk post failed, while the engine was in service, resulting in the release of an HPT blade.

Williams initiated an investigation to understand the root cause of the cracks and to determine the necessary corrective action. Williams found that, between August 2018 and July 2019, nine FJ44-2A HPT disks were rejected during inspection after discovery of cracks in the HPT disk post. As part of its investigation, Williams conducted several tests and analysis to determine the failure mechanism. Engine tests confirmed that FJ44-2A and FJ44-2C model turbofan engines operate at a higher temperature than most recently certified engines. Metallurgical evaluation showed cracking is inter-granular with oxidation attack near and around the crack, with no fatigue striations. Metallurgical evaluation and comparison of HPT disk, part number (P/N) 67093, installed on both FJ44-2A and FJ44-3A model turbofan engines, showed cracking of the HPT disk.

As a result of this investigation, Williams determined the root cause of this cracking was due to higher temperatures and a difference in manufacturing processes (electrical discharge machining vs. broaching). Williams determined that these cracks have only occurred on HPT disks with P/N 67093. Williams subsequently issued service information to instruct operators to remove the HPT disk, P/N 67093. This condition, if

not addressed, could result in failure of the engine, in-flight shutdown of the engine, and loss of control of the aircraft.

### **FAA's Determination**

The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop on other products of the same type design.

### **Related Service Information under 1 CFR Part 51**

The FAA reviewed Williams International Service Bulletin (SB) WISB-72-1032, dated March 23, 2020. This service information specifies procedures for removing and replacing the HPT rotor assemblies that include HPT disk, P/N 67093. The service information also provides instructions for incorporating the latest HPT combustor/fuel slinger module on FJ44-2A and FJ44-2C model turbofan engines. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

### **Other Related Service Information**

The FAA reviewed Williams International SB WISB-72-1034, Revision 1, dated June 10, 2020. Williams International SB WISB-72-1034 describes procedures for re-identifying the HPT rotor assembly and HPT disk.

### **Proposed AD Requirements in this NPRM**

This proposed AD would require removing the HPT disk, P/N 67093, from service before reaching its new life limit and replacing it with a part eligible for installation.

### **Differences Between this Proposed AD and the Service Information**

The Accomplishment Instructions, paragraph 2.D., of Williams International SB WISB-72-1032, dated March 23, 2020, instruct operators of FJ44-2A and FJ44-2C model turbofan engines to replace or rework the HPT combustor/fuel slinger module on FJ44-2A and FJ44-2C model turbofan engines, while this proposed AD does not. Replacement or rework of the HPT combustor/fuel slinger module is not necessary to resolve the unsafe condition in this proposed AD and is therefore not proposed by this AD.

The Accomplishment Instructions, paragraphs 2.C. and E. and 3.C. and D., of Williams International SB WISB-72-1032, dated March 23, 2020, specify procedures for removing and replacing the HP turbine rotor assembly containing HPT disk, P/N 67093, whereas this proposed AD mandates removing and replacing the HPT disk, P/N 67093. Although removing the HPT rotor assembly is a necessary step in the replacement of the HPT disk, this proposed AD only requires replacement of the HPT disk to resolve the unsafe condition addressed by this proposed AD.

### **Costs of Compliance**

The FAA estimates that this AD, if adopted as proposed, would affect 213 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this proposed AD:

#### **Estimated costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
Remove and replace the HPT disk	33 work-hours x \$85 per hour = \$2,805	\$16,694	\$19,499	\$4,153,287

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some of the costs of this proposed AD may be covered under warranty, thereby reducing the cost impact on affected operators.

### **Authority for this Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority

because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

### **Regulatory Findings**

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

### **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

### **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

### **§ 39.13 [Amended]**

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive:

**Williams International Co., L.L.C.:** Docket No. FAA-2021-0511; Project Identifier AD-2020-01229-E.

### **(a) Comments Due Date**

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to Williams International Co., L.L.C. (Williams) FJ44-2A, FJ44-2C, FJ44-3A, and FJ44-3A-24 model turbofan engines with a serial number identified in paragraph 1.A., Effectivity, of Williams International Service Bulletin WISB-72-1032, dated March 23, 2020 (the SB), with an installed high-pressure turbine (HPT) disk, part number (P/N) 67093.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

**(e) Unsafe Condition**

This AD was prompted by a report of cracks in the HPT disk posts and failure of an HPT disk post, resulting in the release of an HPT blade. The FAA is issuing this AD to prevent cracking and failure of the HPT disk posts. The unsafe condition, if not addressed, could result in uncontained release of the HPT blade, damage to the engine, and damage to the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) For FJ44-2A and FJ44-2C model turbofan engines, within the compliance times specified in Table 1 to paragraph (g) of this AD, remove the affected HPT disk from service and replace it with a part eligible for installation using paragraphs 2.C. and E., Accomplishment Instructions – FJ44-2A & FJ44-2C, of the SB.

(2) For FJ44-3A and FJ44-3A-24 model turbofan engines, within the compliance times specified in Table 1 to paragraph (g) of this AD, remove the affected HPT disk from service and replace it with a part eligible for installation using paragraphs 3.C. and D., of the SB.

**Table 1 to Paragraph (g) – Compliance Time**

<b>HPT disk, P/N 67093, cycles since new (CSN) as of the effective date of this AD</b>	<b>Replace within HPT disk cycles</b>
Less than 1,000 CSN	1,620 CSN
1,000 to 2,000 CSN	2,530 CSN
2,001 to 3,000 CSN	3,245 CSN
3,001 to 4,000 CSN	4,130 CSN
4,001 or higher CSN	130 cycles after the effective date of this AD

**(h) Definition**

For the purpose of this AD, a part eligible for installation is an HPT disk with a P/N other than P/N 67093.

**(i) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, Chicago ACO, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(j) Related Information**

(1) For more information about this AD, contact Kyle Bush, Aviation Safety Engineer, Chicago ACO Branch, FAA, 2300 East Devon Avenue, Des Plaines, IL 60018; phone: (847) 294-7870; fax: (847) 294-7834; email: kyle.bush@faa.gov.

(2) For service information identified in this AD, contact Williams International Co., L.L.C., Product Support, 2000 Centerpoint Pkwy, Pontiac, MI 48341; phone: (800) 859-3544; website: <http://www.williams-int.com/product-support>. You may view this referenced service information at the FAA, Airworthiness Products Section, Operational



Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

Issued on June 21, 2021.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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